



Docket No.: 79867

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Strömberg et al.

Application No.: 10/750,181

Confirmation No.: 5000

Filed: December 31, 2003

Art Unit: 1775

For: AN INJECTION MOLDED PRODUCT AND A
METHOD FOR ITS MANUFACTURE

Examiner: Cathy Fong Fong Lam

DECLARATION UNDER 37. C.F.R. §1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Samuli Strömberg, pursuant to 37 C.F.R. §1.132, declares as follows.

1. I am the named inventor in the above identified patent application. In 1999 I received a Masters of Science Degree from Tampere University of Technology in material science which included the study of polymer materials and paper converting. I several years of experience in making products which include integrated circuit chips and antennas mounted on plastic substrates. These products are known as "smart cards". I am also familiar with products and environments in which smart cards are used. Since June 1998 have been employed by UPM Raflatac, RFID which is involved in developing and making smart cards and I am currently the vice president of marketing for that company. In this position I am responsible for global marketing which includes managing products, end-user/partner marketing and marketing communications. Prior to my current position, I have had the following positions and duties.

a. I was research and development manager. In that position I was responsible for developing first generation RF RFID transponders and manufacturing technology for smart card, ticketing, library and airline markets. This job focused on developing new and innovative material concepts for RFID smart card and ticket markets.

b. I was a research manger with the responsibility of managing longer term research projects such as the development of first generation UHF transponders in cooperation with several technology partners.

c. I was Vice President of Technology Development and was responsible for evaluating and developing next generation manufacturing technology for RFID transponders.

d. I was Vice President of Operations Development and was responsible for planning my company's investments which included investments concerning RFID transponders and smart cards in the United States.

e. I was Technology Development Director and Marketing director and had the responsibility of developing my company's end-user marketing approach and also had the responsibility of developing my company's retail business which included business concerning RFID transponders and smart cards.

2. I have studied problems related to smart cards when they are attached or embedded to injection moulded products. In the latter circumstance, the smart cards have to be attached to the surface of the product after the injection moulding process by gluing the smart card onto the surface of the product. In the case of embedding, the smart card is added into a mould beforehand and hot plastic is injected on it. However, a common problem is that air remains inside the product and produces a cavity near the smart card. Thus, the strength of the injection moulded product is weakened.

3. The product and method described in the above captioned patent application solve the problem in the prior art described above. In the product and method of this patent application, an integrated circuit on a chip and a circuitry pattern are on the surface of a carrier web. An intermediate layer overlies the surface of the carrier web. The intermediate layer is attached to the carrier web to provide a multilayered film smart card with the chip and circuitry pattern before the injection moulding process. The intermediate layer of the smart card achieves a firm bond between the injection moulded material and the smart card. The intermediate layer melts when the injection moulded material, i.e. hot plastic, meets the smart card and thus the firm bond is formed between the smart card and the injection moulded product and no cavities exist. Materials for the carrier web and intermediate layer have to be carefully selected and not just any polymeric film will be suitable for each layer.

4. Multilayered products with a chip and antenna carried between two films are known. Most have been laminated between polyvinyl chloride (PVC) layers or acrylonitrile/butadiene/styrene (ABS) layers. ABS is harder and more difficult to process. These materials do not tolerate higher temperatures needed to mount the antenna and chips on a carrier web and have required less advantageous lower mounting temperatures or complex mounting procedures. Films with higher softening temperatures result in poor processing and are not readily heat sealed to each other.

5. Further, the carrier web must be a film with a stiffness, thermoresistive properties, high tensile strength and proper optics which permit it to be used as part of a smart card, and permit the multilayered smart card to be made in high speed processing before it is inserted into the injection mould. Even further, the film of the carrier web must resist temperature degradation, as well as not buckle or warp during the injection moulding process to make the product which is the subject of this patent application.

6. It is important that a carrier web, which has an integrated circuit on a chip and a circuitry pattern on its surface, does not melt due to hot plastic in the injection mould. The smart card is destroyed if the carrier web melts. The circuitry pattern on the carrier web film has a precise size and shape, and the integrated circuit on the chip on the carrier web film has a precise position on a carrier web in regard to the circuitry pattern. All of the latter positioning changes if the carrier web melts and

loses its dimensional stability. Therefore, it is important to select the material of the carrier web so that it does not melt during the injection moulding process. Polyester and biaxially orientated polypropylene are unique in that they permit the high speed manufacture of the smart card, but have properties that will survive the injection moulding process.

7. The use of the carefully selected carrier web in combination with a lower melting thermoplastic intermediate layer which melts to affix the smart card to an injection moulded product provides a combination which is not only unique, but is a result of the careful selection of materials to provide a combination of low melting intermediate layer, and a high melting carrier layer web with specific properties which solve a previously unsolved problem in the prior art.

The undersigned, being warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. §1001) and may jeopardize the validity of the application or any patent issuing thereon, hereby declares that the above statements made of my own knowledge are true and that all statements made on information and belief are believed to be true.

Date: February 22, 2006



Samuli Strömberg

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